

CLAIMS

5 What is claimed is:

1. A seal-assembly for sealing a toner passage in a toner hopper used in an image forming apparatus, said seal-assembly comprising:

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a seal-insert cut from a sheet of material including a middle layer sandwiched between a top adherent layer and a bottom adherent layer; and

and a bottom release liner layer is removably adhered to at least a portion of said bottom adherent layer to protect said bottom adherent layer; and

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and a top release liner layer is removably adhered to at least a portion of said top adherent layer to protect said top adherent layer; and

whereby the outer perimeter of said seal-insert is formed with a kiss-cut cutting all the way through all layers; and

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whereby said top release liner layer is removed at least over a portion of said seal-insert; and

whereby said seal-insert includes a main body portion and a handle that includes said middle layer, said top adherent layer, said bottom adherent layer, said top release liner layer and said bottom release liner layer, all corresponding to layers of said main body portion of

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said seal-insert; and

whereby there is a kiss-cut that divides said main body portion of said seal-insert from said handle of said seal-insert; and

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whereby said kiss-cut goes through all layers of said seal-insert except for said bottom release liner layer so that pulling on said handle will pull on said bottom release liner layer to remove said bottom release liner layer and thus expose said bottom adherent layer; and

whereby a tear-able material which tears relatively straight in one direction is attached
35 to said top adherent layer over said main body portion of said seal-insert; and

a pull-means is attached to said tear-able material for tearing said tearing layer; and
whereby the seal-assembly installer pulls on said handle; and
whereby said bottom adherent layer can thus attach to a toner hopper of a toner
cartridge so that said seal-assembly will seal the toner cartridge which will thus remove said
5 bottom release liner layer, thus exposing said bottom adherent layer; and

whereby pulling on said pull-means by the toner cartridge installer will cause a tear in
said tear-able layer and create an opening over said open central region to allow toner to flow
through said open central region of said seal-insert to begin use of the toner cartridge.

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2. A seal-assembly as in claim 1 wherein said adherent layers comprise adhesive
material.

3. A seal-assembly as in claim 1 wherein said adherent layers comprise tape materials
15 whereby said tape materials include adhesive on two opposite surfaces.

4. A seal-assembly as in claim 3 wherein said tape materials includes a carrier in
between two layers of glue or adhesive.

20 5. A seal-assembly as in claim 1 wherein said adherent layers comprise a glue material.

6. A seal-assembly as in claim 1 whereby said pull-strip comprises a strip of tear-able
material which is unitary with said layer of tear-able material.

25 7. A seal-assembly as in claim 1 whereby said pull-strip comprises a tear-guide.

8. A seal-assembly as in claim 1 wherein a connecting region is formed in the vicinity
where said pull-strip connects to said tear-able layer; and

whereby a first pre-cut and a second pre-cut are proximately located in said connecting
30 region or adjacent said connecting region, said first and second pre-cuts determining a location
of an initial tear of said tear-able layer in said main body portion.

9. A seal-assembly as in claim 1 wherein a masking portion is located between said
tear-able layer and said top adherent layer.

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10. A seal-assembly as in claim 9 whereby said masking portion includes more than one discrete region on said release liner layer.

11. A seal-assembly as in claim 1 whereby said tear-able layer is conductive.

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12. A seal-assembly as in claim 1 whereby said pull-strip layer is conductive.

13. A seal-assembly as in claim 1 whereby said seal-assembly includes a removably adhered positioning support.

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14. A seal-assembly as in claim 1 whereby said middle layer of said seal-assembly is rigid or semi-rigid so that seal will install easily without requiring a removable positioning support.

15. A seal-assembly for sealing a passage in a hopper, said seal-assembly comprising:
15 a main body comprising a middle layer, a first adherent layer, a first release liner, a second adherent layer, a second release liner layer and a tearing layer;

said first adherent layer including a first surface and a second surface, said first surface having masking means for preventing said first adherent layer from adhering to said tearing layer and non-masking means for substantially adhering said first adherent layer to said tearing layer, and said second surface for adhering said first adherent layer to said middle layer;

20 said tearing layer divided into at least one masking portion and at least one non-masking portion; and

said first release liner removably attached to said first adherent layer between said first surface of said first adherent layer and said masking portion of said tearing layer; and

25 said non-masking portion of said tearing layer is attached to said non-masking means; and

a pull-means is attached to said tearing layer for tearing said tearing layer; and

an initialization handle attached to said main body comprising said same layers as said
30 main body except for said tearing layer; and

there is a discontinuity between said initialization handle and said main body of all said layers except for said second release liner layer; and

whereby the seal-assembly installer can grab said initialization handle and thereby pull said second release liner to remove said second release liner to thereby expose said second

adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly is attached to said hopper joined by said second adherent layer.

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16. A seal-assembly for sealing a passage in a hopper, said seal-assembly comprising:
a main body comprising a middle layer, a first adherent layer, a first release liner, a
second adherent layer, a second release liner and a tearing layer;

said first adherent layer including a first surface and a second surface, said first surface
10 having at least one kiss-cut masking means for preventing a masking portion of said first
adherent layer from adhering to said tearing layer; and

at least one kiss-cut non-masking means for allowing a non-masking portion of said
first adherent layer to adhere to said tearing layer; and

said second surface for adhering said first adherent layer to said middle layer; and
15 a pull-means is attached to said tearing layer for tearing said tearing layer; and

an initialization handle attached to said main body comprising said same layers as said
main body except for said tearing layer; and

there is a discontinuity between said initialization handle and said main body of all
said layers except for said second release liner layer; and

20 whereby the seal-assembly installer can grab said initialization handle and thereby pull
said second release liner to remove said second release liner to thereby expose said second
adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly
is attached to said hopper joined by said second adherent layer.

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17. A seal-assembly for sealing a passage in a hopper, said seal-assembly comprising:
a main body comprising a middle layer, a first adherent layer, a first release liner, a
second adherent layer, a second release liner and a tearing layer;

said first adherent layer including a first surface and a second surface, said first surface
30 having masking means for preventing said first adherent layer from adhering to said tearing
layer and non-masking means for substantially adhering said first adherent layer to said tearing
layer, and said second surface for adhering said first adherent layer to said middle layer;

said first release liner attached to said first adherent layer between said first surface of
said first adherent layer and said tearing layer; and

35 said tearing layer is attached to said non-masking means; and

an initialization handle attached to said main body comprising said same layers as said main body except for said tearing layer; and

there is a discontinuity between said initialization handle and said main body of all said layers except for said second release liner layer; and

5 whereby the seal-assembly installer can grab said initialization handle and thereby pull said second release liner to remove said second release liner to thereby expose said second adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly is attached to said hopper joined by said second adherent layer.

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18. A seal-assembly for sealing a passage in a hopper said seal-assembly comprising:
a main body comprising a middle layer, a first adherent layer, a first release liner, a second adherent layer, a second release liner and a tearing layer;

15 said first adherent layer including a first surface and a second surface, said first surface having at least one kiss-cut masking means for preventing a masking portion of said first adherent layer from adhering to said tearing layer; and

at least one kiss-cut non-masking means for allowing a non-masking portion of said first adherent layer to adhere to said tearing layer; and

20 said second surface for adhering said first adherent layer to said middle layer; and

an initialization handle attached to said main body comprising said same layers as said main body except for said tearing layer; and

there is a discontinuity between said initialization handle and said main body of all said layers except for said second release liner layer; and

25 whereby the seal-assembly installer can grab said initialization handle and thereby pull said second release liner to remove said second release liner to thereby expose said second adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly is attached to said hopper joined by said second adherent layer.

30 19. A seal-assembly for sealing a passage in a hopper said seal-assembly comprising:
a main body comprising a middle layer, a first adherent layer, a masking layer, a second adherent layer, a release liner and a layer of tear-able material;

said first adherent layer including a first surface and a second surface and having an open region;

said masking layer for masking at least one portion of said first adherent layer, said masking layer being kiss-cut;

said middle layer having an open region, said middle layer is attached to said second surface of said first adherent layer;

5 said layer of tear-able material is substantially attached to said first surface of said first adherent layer and said masking layer, whereby said masking layer prevents attachment of a portion of said layer of tear-able material to said first adherent layer; and

 a pull means is attached to said tear-able layer for tearing said layer of tear-able material; and

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 an initialization handle attached to said main body comprising said same layers as said main body except for said tearing layer; and

 there is a discontinuity between said initialization handle and said main body of all said layers except for said second release liner layer; and

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 whereby the seal-assembly installer can grab said initialization handle and thereby pull said second release liner to remove said second release liner to thereby expose said second adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly is attached to said hopper joined by said second adherent layer.

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20. A seal-assembly for sealing a passage in a hopper, said seal-assembly comprising: a main body portion, said main body portion including a middle layer, a first adherent layer, a masking layer, a second adherent layer, a release liner and a layer of tear-able material;

25 whereby there is an open region in said middle layer and said first adherent layer; and

 whereby said masking layer is formed by at least one kiss-cut and said masking layer masks adhesive properties of a first surface of said first adherent layer; and

30 whereby a substantially orthogonal projection of said kiss-cut separates at least one masking portion from at least one non-masking portion of said first surface of said first adherent layer; and

 whereby a substantially orthogonal projection of said kiss-cut separates at least one masking portion from at least one non-masking portion of a first surface of said layer of tear-able material; and

35 whereby a second surface of said first adherent layer adheres to said middle layer; and

whereby said non-masking portion of said layer of tear-able material adheres to said non-masking portion of said first surface of said first adherent layer; and

whereby said masking layer forms a barrier between said masking portion of said first surface of said first adherent layer and said masking portion of said layer of tear-able material
5 to prevent adhesion between said masking portion of said tear-able material and said masking portion of said first surface of said first adherent layer; and

whereby a pull-strip is attached to said main body portion of said seal-assembly; and
an initialization handle attached to said main body comprising said same layers as said main body except for said tearing layer; and

10 there is a discontinuity between said initialization handle and said main body of all said layers except for said second release liner layer; and

whereby the seal-assembly installer can grab said initialization handle and thereby pull said second release liner to remove said second release liner to thereby expose said second adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly
15 is attached to said hopper joined by said second adherent layer.

21. A seal-assembly for sealing a passage in a hopper said seal-assembly comprising:
a main body portion, said main body portion including a middle layer defining a first opening,

20 a first adherent layer including a second opening in register with said first opening of said middle layer, said first adherent layer having a first surface and a second surface, said second surface of said first adherent layer is adjacent said middle layer and said first surface of said first adherent layer further including at least one masking region, whereby said masking region is covered by a kiss-cut release liner; and

25 a tear-able layer wherein said tear-able layer is adhered to said first surface of said first adherent layer except where said masking region is covered by said kiss-cut release liner, thereby said kiss-cut release liner is covered by said tear-able layer; and

a second adherent layer and a release liner; and

30 a pull-strip is connected to said tear-able layer; and

an initialization handle attached to said main body portion comprising said same layers as said main body except for said tear-able layer; and

there is a discontinuity between said initialization handle and said main body of all said layers except for said release liner; and

whereby the seal-assembly installer can grab said initialization handle and thereby pull said release liner to remove said release liner to thereby expose said second adherent layer and thereby attach said seal-assembly to a hopper such that said seal-assembly is attached to said hopper joined by said second adherent layer.

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22. A seal-assembly as in claim 21 wherein said adherent layers comprise adhesive material.

23. A seal-assembly as in claim 21 wherein said adherent layers comprise tape
10 materials whereby said tape materials include adhesive on two opposite surfaces.

24. A seal-assembly as in claim 23 wherein said tape materials includes a carrier in between two layers of glue or adhesive.

15 25. A seal-assembly as in claim 21 wherein said adherent layers comprise a glue material.

26. A seal-assembly as in claim 21 whereby said pull-strip comprises a strip of tear-
able material which is unitary with said layer of tear-able material.
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27. A seal-assembly as in claim 21 whereby said pull-strip comprises a tear-guide.

28. A seal-assembly as in claim 21 wherein a connecting region is formed in the vicinity where said pull-strip connects to said tear-able layer; and
25 whereby a first pre-cut and a second pre-cut are proximately located in said connecting region or adjacent said connecting region, said first and second pre-cuts determining a location of an initial tear of said tear-able layer in said main body portion.

29. A seal-assembly as in claim 21 wherein a masking portion is located between said
30 tear-able layer and said top adherent layer.

30. A seal-assembly as in claim 29 whereby said masking portion includes more than one discrete region on said release liner layer.

35 31. A seal-assembly as in claim 21 whereby said tear-able layer is conductive.

32. A seal-assembly as in claim 21 whereby said pull-strip layer is conductive.

33. A seal-assembly as in claim 21 whereby said seal-assembly includes a removably adhered positioning support.

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34. A seal-assembly as in claim 21 whereby said middle layer of said seal-assembly is rigid or semi-rigid so that seal will install easily without requiring a removable positioning support.

10 35. A method of forming a seal-assembly for sealing a toner passage in a toner hopper used in an image forming apparatus by

laminating a sheet of material whereby the laminate includes;

15 a middle layer, a first adherent layer, a second adherent layer, a release liner; whereby a seal-insert is formed by die-cutting the laminate having an open region through all layers; and

20 and whereby a tear-able material is attached to at least a portion of the top adherent layer;

a pull-means is attached to the tear-able material for tearing the tear-able material; and the release liner layer is removably adhered to at least a portion of the bottom adherent layer to protect the bottom adherent layer prior to use of the seal-assembly; and

25 whereby the seal-insert includes a handle that includes the middle layer, the top adherent layer, the bottom adherent layer and the release liner layer; and

whereby a kiss-cut is formed that divides a main body portion of the seal-insert from a handle portion of the seal-insert; and

30 whereby the kiss-cut goes through all layers of the seal-insert except for the release liner layer so that pulling on the handle will pull on the release liner layer to remove the release liner layer and thus expose the bottom adherent layer; and

whereby the bottom adherent layer will attach to a toner hopper of a toner cartridge so that the seal-assembly will seal the toner cartridge; and

whereby pulling on the pull-means will cause a tear in the tear-able layer and create an opening over the open central region to allow toner to flow through the open central region of the seal-insert to begin use of the toner cartridge.

5 36. A method of forming a seal-assembly for sealing a passage in a hopper comprising the steps of:

 providing a main body portion including a middle layer defining a first opening, a first adherent layer including a second opening in register with the first opening of the middle layer, the first adherent layer having a first surface and a second surface, the first surface of
10 first adherent layer is adjacent the middle layer and the second surface of the first adherent layer is adjacent a first release liner layer, and providing a second adherent layer and a second release liner layer;

 forming at least one kiss-cut fully through the first release liner layer, wherein the kiss-cut separates the first release liner layer into at least one masking portion and at least one non-
15 masking portion;

 removing the non-masking portion of the first release liner layer to generate an exposed portion of the first adherent layer thereby further providing a non-exposed portion of the first adherent layer under the masking portion of the first release liner layer;

 adhering a layer of tear-able material to the exposed portion of the first adherent layer,
20 wherein a pull-strip is attached to the layer of tear-able material; and

 forming an initialization handle attached to the main body portion comprising the same layers as said main body portion except for the tear-able layer; and

 forming a kiss-cut between the initialization handle and the main body portion of all the layers except for the second release liner; and

25 whereby the seal-assembly installer can grab the initialization handle and thereby pull the second release liner to remove the second release liner to thereby expose the second adherent layer and thereby attach the seal-assembly to a hopper such that the seal-assembly is attached to the hopper joined by the second adherent layer.

30 37. A method of forming a seal-assembly for sealing a passage in a hopper comprising the steps of:

 providing a main body portion including a middle layer defining a first opening, a first adherent layer including a second opening in register with the first opening of the middle layer, the first adherent layer having a first surface and a second surface, the first surface of
35 first adherent layer is adjacent the middle layer and the second surface of the first adherent

layer is adjacent a first release liner layer, and providing a second adherent layer and a second release liner layer;

adhering a layer of tear-able material to the exposed portion of the first adherent layer,
5 wherein a pull-strip is attached to the layer of tear-able material; and
forming an initialization handle attached to the main body portion comprising the same layers as said main body portion except for the tear-able layer; and
forming a kiss-cut between the initialization handle and the main body portion of all the layers except for the second release liner; and
10 whereby the seal-assembly installer can grab the initialization handle and thereby pull the second release liner to remove the second release liner to thereby expose the second adherent layer and thereby attach the seal-assembly to a hopper such that the seal-assembly is attached to the hopper joined by the second adherent layer.

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38. A seal-assembly page containing at least one seal-assembly which is used for sealing a toner passage in a toner hopper used in an image forming apparatus, said seal-assembly comprising:

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a sheet of material whereby said sheet includes a middle layer sandwiched between a top adherent layer and a bottom adherent layer; and

whereby a top release liner is on top of said top adherent layer and a bottom release liner is underneath said bottom adherent layer; and

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at least one seal-insert portion is formed in said sheet of material; and

whereby at least a portion of said top release liner is removed from at least a portion of said seal-insert portion, thus exposing some of said top adherent layer; and

whereby a tear-able material is attached to at least a portion of said top adherent layer where said top release liner was removed; and

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a pull-means is attached to said tear-able material for tearing said tearing layer; and

whereby when a seal-installer installs a said seal-assembly, he grabs the pull means and lifts said seal-assembly off the sheet of material, thus separating said seal-assembly from said sheet of material, and thus exposing said bottom adherent layer of said seal-assembly so that said seal-assembly may be installed into a toner hopper.

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39. A method of manufacturing a seal-assembly page containing at least one seal-
5 assembly which is used for sealing a toner passage in a toner hopper used in an image forming
apparatus, said method comprising the following steps:

laminate a sheet of material whereby the sheet includes a middle layer sandwiched
between a top adherent layer and a bottom adherent layer; and
10 whereby a top release liner is on top of said top adherent layer and a bottom release
liner is underneath said bottom adherent layer; and

form at least one seal-insert portion in the sheet of material by die-cutting; and
remove at least a portion of the top release liner from at least a portion of the seal-
15 insert portion, thus exposing some of the top adherent layer; and
attach a tear-able material to at least a portion of the top adherent layer where the top
release liner was removed; and
attach a pull-means to the tear-able material for later tearing the tearing layer so that
when a seal-installer installs a seal-assembly, he may grab the pull means and lift the seal-
20 assembly off the sheet of material, thus separating the seal-assembly from the sheet of
material, and thus exposing the bottom adherent layer of the seal-assembly so that the seal-
assembly may be installed into a toner hopper.

40. A seal-assembly page containing at least one seal-assembly which is used for
25 sealing a toner passage in a toner hopper used in an image forming apparatus, said seal-
assembly comprising:

a sheet of material whereby said sheet of material includes a middle layer sandwiched
between a top adherent layer and a bottom adherent layer; and
30 a bottom release liner layer which is removably adhered to at least a portion of said
bottom adherent layer to protect said bottom adherent layer; and
a top release liner layer which is removably adhered to at least a portion of said top
adherent layer to protect said top adherent layer; and
35 whereby at least one seal-insert is cut within said sheet; and

whereby the outer perimeter of said seal insert is formed with a kiss-cut cutting all the way through all layers except said bottom release liner layer; and

whereby said top release liner layer is removed at least over a portion of said seal-insert; and

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whereby a tear assembly is attached to at least a portion of said top adherent layer over said seal-insert; and

whereby said tear assembly comprises a material that tears substantially straight and a pull-means which is attached to said material that tears substantially straight ; and

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whereby a seal installer pulls said pulling means to remove a seal-assembly from said bottom release liner which is part of said sheet to thereby expose said bottom adherent layer so that said seal-assembly can be installed; and

whereby said bottom adherent layer can thus attach to a toner hopper of a toner
15 cartridge so that said seal-assembly will seal the toner cartridge; and

whereby pulling on said pull-means by the toner cartridge installer will cause a tear in said tear-able layer and create an opening over said open central region to allow toner to flow through said open central region of said seal-insert to begin use of the toner cartridge.

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41. A seal-assembly page as in claim 40 wherein said adherent layers comprise adhesive material.

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42. A seal-assembly page as in claim 40 wherein said adherent layers comprise tape materials whereby said tape materials include adhesive on two opposite surfaces.

43. A seal-assembly page as in claim 42 wherein said tape materials includes a carrier in between two layers of glue or adhesive.

44. A seal-assembly page as in claim 40 wherein said adherent layers comprise a glue
30 material.

45. A seal-assembly page as in claim 40 whereby said pull-strip comprises a strip of tear-able material which is unitary with said layer of tear-able material.

46. A seal-assembly page as in claim 40 whereby said pull-strip comprises a tear-guide.

47. A seal-assembly page as in claim 40 wherein a connecting region is formed in the vicinity where said pull-strip connects to said tear-able layer; and
whereby a first pre-cut and a second pre-cut are proximately located in said connecting region or adjacent said connecting region, said first and second pre-cuts determining a location of an initial tear of said tear-able layer in said main body portion.

48. A seal-assembly page as in claim 40 wherein a masking portion is located between said tear-able layer and said top adherent layer.

49. A seal-assembly page as in claim 48 whereby said masking portion includes more than one discrete region on said release liner layer.

50. A seal-assembly page as in claim 40 whereby said tear-able layer is conductive.

51. A seal-assembly page as in claim 40 whereby said pull-strip layer is conductive.

52. A seal-assembly page as in claim 40 whereby said seal-assembly includes a removably adhered positioning support.

53. A seal-assembly page as in claim 40 whereby said middle layer of said seal-assembly is rigid or semi-rigid so that seal will install easily without requiring a removable positioning support.

54. A multiple strip-assembly page comprising a low-tack paper having a low tack adhesive layer and at least one strip-assembly removably adhered to said low tack adhesive layer; and

whereby said strip-assembly comprises a strip layer, an adherent layer and a release liner; and

whereby said strip layer has a top surface and a bottom surface; and
whereby said bottom surface of said strip layer is removably adhered to said low tack adhesive layer of said low tack paper; and

whereby said top surface of said strip layer is adhered to a bottom surface of said adherent layer; and

whereby said release liner is removably adhered to a top surface of said adherent layer; and

5 whereby a kiss-cut is made through all layers including said low tack paper layer including said low tack adhesive layer and said strip assembly including said strip layer, said adherent layer, and not fully through said release liner to divide said strip assembly into a body portion and a handle portion; and

10 whereby the strip installer peels a strip assembly from a multiple strip page and then pulls on said handle portion to thereby remove said release liner from said strip-assembly and thus expose said bottom surface of said adherent layer so that said strip assembly may be installed.

15 55. A method of manufacturing a multiple strip-assembly page comprising a low-tack paper having a low tack adhesive layer and at least one strip-assembly removably adhered to the low tack adhesive layer; and

20 whereby the strip-assembly comprises a strip layer, an adherent layer and a release liner; and

whereby the strip layer has a top surface and a bottom surface; and

whereby the bottom surface of the strip layer is removably adhered to the low tack adhesive layer of the low tack paper; and

25 whereby the top surface of the strip layer is adhered to a bottom surface of the adherent layer; and

whereby the release liner is removably adhered to a top surface of the adherent layer; and

30 forming a kiss-cut through all layers including the low tack paper layer including the low tack adhesive layer and the strip assembly including the strip layer, the adherent layer, and not fully through the release liner and thereby dividing the strip assembly into a body portion and a handle portion; and

35 whereby the strip installer peels a strip assembly from a multiple strip page and then pulls on the handle portion to thereby remove the release liner from the strip-assembly and thus expose the bottom surface of the adherent layer so that the strip assembly may be installed.